



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF  
HARVARD UNIVERSITY, NEW SERIES, No. X.

By B. L. ROBINSON AND J. M. GREENMAN.

Presented May 13, 1896.

I. — REVISION OF THE GENUS TRIDAX.

**TRIDAX**, L. (Name supposed to come from *τρίς*, thrice, and *δακύν*, to bite, referring to the trifid rays.) — Heads terminal upon long peduncles, heterogamous and radiate or rarely homogamous and discoid. Involucre campanulate to sub-cylindric, 2-several-seriate, very rarely sub-uniseriate; scales all or at least the inner scarious and commonly purple-margined. Receptacle mostly conical. Ray-flowers, when present, fertile; ligules yellow, white, or roseate, clearly or obsoletely bilabiate; external lip 3-toothed or deeply trifid, obovate or oblong in outline, patulous; the inner of 1 or 2 short erect teeth or sometimes wanting; disk-flowers usually (if not always?) yellow, regular, 5-toothed. Anthers short, sagittate at the base, appendaged at the apex. Style-branches terminating in short or long subulate appendages. Achenes turbinate, hirsute or upwardly silky-villous, very rarely glabrous or nearly so. Pappus of several to many narrow ciliate scales attenuate to plumose awns (except in *C. dubia*). — Hort. Cliff. 418, & Gen. no. 979; DC. Prodr. v. 679; Benth. & Hook. f. Gen. ii. 392; Hoffm. in Engl. & Prantl, Nat. Pflanzenf. iv. Ab. 5, 247. *Bartolina*, Adans. Fam. ii. 124. *Sogalgina*, Cass. Bull. Philom. 1818, & Dict. Sci. Nat. xlix. 397. *Balbisia*, Willd. Spec. iii. 2214. *Galinsogea*, HBK. Nov. Gen. & Spec. iv. 252, t. 386. *Ptilostephium*, HBK. l. c. 253, t. 387, 388. *Carphostelphium*, Cass. Dict. Sci. Nat. xlv. 62. *Mandonia*, Wedd. Bull. Soc. Bot. Fr. xi. 50, t. 1, not Schz. Bip. — Pubescent annuals or perennials not rarely lig-nescent at the base, with leaves opposite, petiolate or sessile, subterre or more often dentate or irregularly cleft or pinnatifid. About 22 known species, two of them of the S. American Andes, the others confined to Mexico, except a single species which extends also to Mauritius and E. India.

Subgenus EUTRIDAX. Scales of the involucre 2—several-seriate: achenes densely silky-villous or hirsute: pappus scales terminating in plumose awns.

§ 1. Scales of the involucre very unequal, regularly imbricated in several to many series, gradually decreasing in size; the outermost very short, mostly scarious and rounded at the summit, very rarely somewhat herbaceous or (in *T. angustifolia*) subacute.

\* Heads discoid: pappus shorter than the achenes.

1. *T. brachylepis*, Hemsl. "Annual, erect," with "slender glabrescent branchlets" and "thickish ovate-lanceolate dentate or sometimes obscurely lobed leaves." — Biol. Cent.-Am. Bot. ii. 207. — Cordillera of Oaxaca, altitude 7,000 feet, *Galeotti*. The only specimen, seen by the writers, closely approximating in its characters Mr. Hemsley's description is no. 1423 of *E. W. Nelson*, collected in the Valley of Oaxaca, altitude 5,500 to 7,500 feet, 20 September, 1894. But although only the upper portion of the root is at hand it is not unlikely perennial.

2. *T. tuberosa*. Distinctly perennial; the elongated woody root at places tuberos-thickened: stem decumbent, subsimple, 3 feet in height, leafy to the middle, hirsute: leaves hirsute upon both surfaces, 3-nerved, 2 inches long, nearly half as broad, cuneate at the base and 3-cleft with sharply toothed acute lobes: heads about 6, nearly 7 lines long and 6 lines in diameter: pappus only a third to half the length of the achene. — Collected by *C. G. Pringle*, on the Sierra de San Felipe, Oaxaca, altitude 7,000 to 8,500 feet, 17 November, 1894, no. 5644 a.

3. *T. Pringlei*. Perennial, decumbent, much branched from near the base, 2 feet high, pubescent throughout but less hirsute than the preceding: root woody, tuberos-thickened at intervals: leaves lanceolate, dentate or subentire, obtusish, 1 to 1½ inches long, scarcely a third as broad, 1-nerved: heads 2 to 4, very similar in all respects to those of the preceding. — Collected by *C. G. Pringle*, on the Sierra de San Felipe, Oaxaca, altitude 7,500 feet, 7 September, 1894, no. 5644. In technical characters very close to the preceding species, but with markedly different foliage.

\* \* Heads radiate: ligules evident.

•+ Mexican species.

++ Rays yellow.

= Pappus very short or none.

4. *T. trilobata*, Hemsl. l. c. 208. Erect much branched glandular-pubescent annual, a foot or two high, with lance-oblong obtusish and coarsely few-toothed or lacinate leaves (cuneate at the base) and numer-

ous showy heads 10 lines to an inch in diameter, with dark purple involucre and broad bright orange-yellow rays. — *Galinsoga trilobata*, Cav. Icon. iii. 42, t. 282; Bot. Mag. t. 1895; Sweet, Brit. Fl. Gard. t. 56. *Sogalgina trilobata*, Cass. Dict. Sci. Nat. xlix. 397. — Valley of Mexico, *Bourgeau*, no. 846; near Chapultepec, *Schaffner*; and on calcareous bluffs, Flor de Maria, *Pringle*, no. 3148; also in Michoacan in fields near Patzcuaro, *Pringle*, no. 4271. The form without any trace of pappus does not appear to differ in any other particular. A specimen cultivated in the Botanic Garden of Harvard University has leaves oblong, subentire.

= = Pappus about equalling or somewhat exceeding the achenes.

5. *T. balbisoides*, Gray. Annual, much branched, pubescent: branches divaricate or the lowest decumbent: leaves from lanceolate and irregularly toothed to deeply ternately cleft or pinnately parted: heads rather numerous, nearly or quite an inch in diameter, with convex or conical disk and spreading showy rays: ligules (exclusive of tube)  $2\frac{1}{2}$  to 4 lines long, as broad or broader. — Proc. Am. Acad. xv. 39. *T. coronopifolia*, Gray, l. c., not Hemsl. *Galinsoga balbisoides*, HBK. Nov. Gen. & Spec. iv. 253, t. 386. *Sogalgina balbisoides*, Cass. l. c. xlix. 398. — Originally collected in Guanajuato between the Valley of Santiago and Lake Palangeo, at 5,500 feet altitude, by *Humboldt & Bonpland*. It is described and figured by Kunth, l. c., as having entire or repand ligules of suborbicular contour. No plants with this character have since been observed, and we follow Dr. Gray in referring to the species the following, which differ only in their more or less distinctly 3-toothed rays: *Schaffner's* no. 238, and *Parry & Palmer's* no. 509, both from San Luis Potosi. Nor does *T. leptophylla*, Gray (l. c. xxi. 391), from Chihuahua (*Palmer's* no. 425, and *Pringle's* no. 769), appear to differ by any constant or satisfactory character. A form from San Luis Potosi, represented by *Parry & Palmer's* no. 508, has the ligules sometimes 3-toothed and sometimes divided nearly to the base into 3 oblong lobes. This plant was rather confidently referred by Dr. Gray (l. c. xv. 39) to *T. coronopifolia*, but it differs from that species decidedly in its much imbricated involucre, with very unequal and rounded scales, and in its attenuate chaff. Nor is the ligule strap-like. In stating it to be so Dr. Gray had presumably observed only one of the long oblong lobes of a very deeply trifid ray.

6. *T. petrophila*. Distinctly perennial from a lignescent base: stems several, very slender, erect or nearly so: branches ascending: leaves very narrow, linear, entire, toothed, or with 2 or 3 short linear lobes:

ray-flowers with ligules much smaller than in the preceding, about  $1\frac{1}{2}$  lines in diameter: the tube being relatively very long and slender (4 to 5 lines in length): chaff terminating in a long and slender awn. — *T. balbisoides*, Gray, l. c. xxii. 430, not xv. 39. *T. balbisoides*, var. *tenuifolia*, Gray, (ined.) in distrib. Palmer and Pringle. — Jalisco, on the Rio Blanco, *Palmer*, no. 569; on rocky hills near Guadalajara, *Pringle*, nos. 2179, 2556. The later collections of Mr. Pringle show this plant quite distinct in its woody base and reduced rays from *T. balbisoides*.

↔ ↔ Rays white, purplish, or roseate.

= Pappus much longer than the achene.

7. *T. rosea*, Schz. Bip. in herb. Hirsutulous annual, leafy near the base and often with spreading branches: leaves linear-oblong, irregularly toothed or trifid with toothed lobes: peduncles becoming very long (6 to 10 inches), quite simple, naked or bearing 1 or 2 minute alternate bracts: heads large, with the spreading rays an inch or more in diameter: ligules oblong, 3 to 5 lines in length, slightly 3-toothed at the apex. — A good but apparently unedited species, founded by Schultz upon *Schaffner's* no. 60, from Guadalupe, and collected in the same locality by *Bilimek* in 1865, no. 488, and *Bourgeau*, no. 586; also in Valley of Mexico, *Schaffner*, no. 265.

= = Pappus shorter than or barely equalling the achene.

8. *T. Palmeri*, Gray. Pubescent or puberulent, 2 feet high, usually with a few ascending branches, naked above: leaves mostly much cleft or deeply and laciniately parted into narrow acute segments: rays broad, obovate, truncate, essentially entire, roseate: disk-flowers greenish yellow. — Proc. Am. Acad. xv. 38. — San Luis Potosi, on rocky bluffs at Alvarez, altitude 8,000 feet, *Parry & Palmer*, nos. 489, 490, 482½, also *Schaffner*, no. 236.

Var. *indivisa*, Robinson & Seaton. Somewhat stouter and more densely pubescent: leaves ovate, subhastate, abruptly contracted into a petiole, repand-dentate, not lobed. — Proc. Am. Acad. xxviii. 109. — Ledges of cañons on mountains near Lake Chapala, Jalisco, *Pringle*, no. 4332. Mr. Pringle states that the base is perennial.

+ + South American species, of the Andes of Bolivia and Ecuador: leaves narrow: pappus longer than the achenes.

9. *T. Mandonii*, Schz. Bip. Branched, hirsute: leaves sinuate or repand-dentate: involucrel scales rounded at the apex, sparingly puberulent near the ends or quite glabrous: rays very small. — Bull. Soc. Bot. Fr. xii. 82, & Linnæa, xxxiv. 536. *Mandonia Boliviensis*, Wedd. Bull.

Soc. Bot. Fr. xi. 51, t. 1. — Near Sorata, Province of Larecaja, altitude 2,690 to 3,000 meters, *Mandon*, no. 289.

10. *T. angustifolia*, Benth. & Hook. f. Decumbent and rooting at the nodes, pubescent: leaves lance-linear, acute, denticulate or entire: involucre scales acutish, pubescent or puberulent on the outer surface; the outer ones inclining to be squarrose: ligules oblong, 2 or 3 lines in length. — Gen. ii. 392. — Collected in the Andes of Ecuador by *Spruce*, no. 5582.

§ 2. Involucral scales 2-3-seriate, less unequal; the outer often herbaceous and acutish.

\* Leaves ovate to linear, pubescent to densely hirsute but not canescent.

+ Leaves relatively broad, subentire, toothed, or divided into a few rather broad lobes.

++ Pappus longer than or about equalling the achenes.

= Perennials with ligneous or lignescent base: rays short, nearly orbicular, 3-toothed.

11. *T. procumbens*, L. More or less densely hirsute with white hairs: stems several to many from a woody root or stock, decumbent or procumbent: leaves lanceolate to ovate-lanceolate, acute, sharply repand- or sinuate-toothed, cuneate at the base: scales of the involucre oblong, acutish, usually villous-hirsute: chaff persistent: rays yellow or (?) white. — Spec. ii. 900. *Amellus pedunculatus*, Ort. *fide* Willd. Enum. 916. *Balbisia elongata*, Willd. Spec. iii. 2214. *B. pedunculata*, Hoffmgg. Verz. Pfl. 228. *B. divaricata*, Cass. Ann. Sci. Nat. xxiii. (1831) 90. — The most widely distributed species; Monterey, North Mexico, *Eaton & Edwards*, also *Pringle*, no. 1920; Wartenberg, near Tantoyuca, *Ervendberg*, no. 61; San Luis Potosi, *Parry & Palmer*, no. 520; "Coahuila and Nuevo Leon," *Palmer*, nos. 629, 2061; Orizaba, *Schaffner, Gray, Botteri*; Jalisco, *Palmer*, no. 297; Colima, *Palmer*, no. 1186; Oaxaca, *L. C. Smith*, no. 423, *E. W. Nelson*, nos. 2582, 2773; Guatemala, nos. 2370, & 4200 of Donnell Smith's sets. Also on Elliott's Key, Fla., *Simpson*, no. 553; Cuba, *Wright*, no. 2861. Introduced and now abundant in E. India and Mauritius.

Var. *ovatifolia*. Less hirsute, pubescence shorter, finer, and tending to become fuscous: base of stem ligneous: leaves ovate, acutish, serrate with small subequal obtusish teeth, finely pubescent upon both surfaces, 8 to 10 lines long, 6 to 8 lines broad, rather abruptly contracted at the base into short petioles: involucre bracts very broad, mostly obovate. — Collected by *E. W. Nelson* in the vicinity of Yalalag, Oaxaca, July, 1894, no. 948. Rather well marked in its foliage and possibly a distinct

species, but agreeing with the type in all floral characters except the somewhat broader involucre scales.

= = Annuals.

12. *T. obovata*, Turcz. Low, 4 to 6 inches in height: leaves obovate, subentire, obtuse: ligules short, yellowish. — Bull. Soc. Nat. Mosc. xxiv. 187; Walp. Ann. 238. — S. Mexico, on Sierra San Pedro, Nolasco, Talea, &c., *Jurgensen*, no. 124. Here we would refer specimens collected near Acapulco by *Palmer*, no. 165.

13. *T. erecta*, Gray. Slender, erect, hirsutulous, branching, a foot or so in height: leaves ovate-lanceolate and serrate or broadly ovate in outline and rather deeply 3-parted with acutish lobes: heads rather small: involucre ovate; one or two of the outer scales often narrow, oblong, and spreading: ligules short, only a line or two in length, 3-toothed, yellow. — Proc. Am. Acad. xxi. 390, 433. — Southwestern Chihuahua, *Palmer*, no. 285.

14. *T. tenuifolia*, Rose. Erect, pubescent, 1 to 2 feet high, branching: leaves ovate, petiolate, dentate but not lobed: outer scales of the involucre acuminate: rays conspicuous, 3 to 5 lines long, pale yellow or "bright white." — Contrib. U. S. Nat. Herb. iii. 319. *T. bicolor*, Gray, Proc. Am. Acad. xxi. 391, as to pl. *Palmer*. — Southwestern Chihuahua, on mountain sides above Batopilas, *Palmer*, no. 130.

Var. *microcephala*, Rose, l. c. Described as differing in its smaller heads and "slightly different disk corollas." — "Near Lodiago, *Palmer*, no. 1611."

++ ++ Pappus shorter than the achenes.

= Annual species of Northwestern Mexico: heads large, an inch in diameter.

15. *T. bicolor*, Gray. Erect annual, with leaves ovate to rather narrowly oblong-lanceolate, serrate-dentate, not lobed, narrowed to slender petioles: ligules reddish or purplish, cuneate-oblong, 3-toothed. — Pl. Fendl. 104. — Llanos in the Sierra Madre, W. Chihuahua, *Wislizenus*, no. 214; also among rocks, Bachimba, *Thurber*, no. 833, and on rocky hills near the town of Chihuahua, *Pringle*, no. 638.

= = Species of Southern Mexico, lignescent at the base.

16. *T. Galeottii*, Klatt. "Stem terete, branched, pilose: leaves petiolate, cuneate, irregularly lobed, pilose upon both surfaces, 2 inches long,  $1\frac{1}{2}$  inches broad, 3-nerved: heads solitary, terminal; involucre scales biseriate, the outer shorter: chaff 3-5-dentate at the apex." — Leopoldina, xxiii. 6. *Ptilostephium Galeottii*, Schz. Bip. *fide* Klatt, l. c. — Between San Andres and San Miguel, *Liebmann*, nos. 588, 693, and

*Galeotti*, no. 2472. A species not seen by the writers. The description is translated and condensed from the original characterization.

+ + Leaves very narrow, linear or lance-linear, or deeply cleft into narrow divisions: heads rather small, 4 to 6 lines broad: rays small, bilabiate, the external lip trifid.

17. *T. coronopifolia*, Hemsl. Low, much branched and spreading, pubescent or hirsute; leaves lance-linear, denticulate, lacinately toothed or pinnatifid with narrow linear unequal acute segments: peduncles slender, toward the summit finely strigillose with appressed white hairs, and lacking the glandular-tipped hairs so common in the genus: rays yellow (or white): pappus scales unequal, some of them subulate and ciliated, others plumose with scarcely dilated base. — Biol. Cent.-Am. Bot. ii. 207. *Ptilostephium coronopifolium*, HBK. Nov. Gen. & Spec. iv. 255, t. 387. We have little hesitation in including in this species also *Tridax trifida*, Gray, Proc. Am. Acad. xv. 39 (*Ptilostephium trifidum*, HBK. l. c. 255, t. 388), notwithstanding the considerable difference in the pappus represented by Kunth. After the examination of a number of specimens we doubt the specific significance of the difference in length of the pappus, and as to the difference in the breadth of the scales that is often considerable upon the same achene. — Mexico without locality, *Th. Coulter*, nos. 348, 430, and *Berlandier*; State of Mexico, *Bilimek*, no. 491, also *Bourgeau*, nos. 164, 705; Tacubaya, *Schaffner*; Mt. Orizaba, altitude 9,000 feet, *Seaton*, no. 273; Oaxaca, Soledad de Etla, altitude 5,300 feet, *L. C. Smith*, no. 361, and by same collector at Telixtlahuaca, no. 866; also by *E. W. Nelson*, in Valley of Oaxaca, altitude 5,100 to 5,800 feet, no. 1229. The formal variety ALBORADIATA (*T. trifida*, var. *alboradiata*, Gray, Proc. Am. Acad. xv. 39), with white rays, but apparently without other significant or constant differences, has a somewhat more northerly distribution, having been collected at San Luis Potosi, *Schaffner*, no. 239, *Parry & Palmer*, no. 511; in Jalisco, *Pringle*, no. 2902; and in Guanajuato, *Dugès*, no. 438.

18. *T. lanceolata*, Klatt. "Lower leaves broadly lanceolate and upper lance-linear, entire: chaff obovate." — Leopoldina, xxiii. 6. — "Tehuacan, *Liebmann*, no. 205; Cuernavaca, *Berlandier*, no. 1063." A species not seen by the writers and (as to description) distinguished from the preceding species chiefly by the characters quoted.

19. *T. imbricata*, Schz. Bip. "Leaves linear-lanceolate, entire, or 1-3-toothed, pilose, ciliated on the margins: external scales of the involucre obtuse, striate, dorsally puberulent." — Schz. Bip. in Klatt, Flora, 1885, 202. — "Real del Monte, *Ehrenberg*, no. 355." We suspect this to be merely a form of *T. coronopifolia*.



\* \* Whole plant canescent-tomentose : leaves linear, entire.

20. *T. candidissima*, Gray. Very white-woolly, 4 to 6 inches high, densely leafy below : leaves 1 to  $1\frac{3}{4}$  inches long, sessile by a sheathing base : peduncles solitary, terminal, naked : heads homogamous : involucre lanceolate, acute : pappus long. — Proc. Am. Acad. xv. 39. — On ashy soil, Angostura, San Luis Potosi, *Parry & Palmer*, no. 510. Not since rediscovered.

Subgenus PSEUDOTRIDAX. Scales of the involucre sub-uniseriate : achenes merely papillose-puberulent or glabrescent : scales of the pappus obtuse or obtusish, laciniately bordered : anomalous species connecting this genus with *Galinsoga*.

21. *T. (?) dubia*, Rose. Decumbent or procumbent pubescent herb ; stems about 2 feet long : leaves ovate, serrate, acutish, petiolate : heads subracemose or subcorymbose, 6 lines in diameter : involucre scales very few, about 5 : ray-flowers with short golden yellow 3-toothed ligules. — Contrib. U. S. Nat. Herb. i. 337, t. 33. — Along river bottoms, Colima, *Palmer*, no. 1173 ; also in lowlands near San Blas, Tepic, *Lamb*, no. 609.

Species (doubtless of *Eutridax* but otherwise) of doubtful affinities : not seen by the writers.

22. *T. Ehrenbergii*, Schz. Bip. "Stem herbaceous, elongated, climbing, sulcate, sparingly pilose, trichotomous : leaves rhomboidal, slender-petioled, acuminate serrate, 3-nerved, above sparsely pubescent, below pilose upon the nerves : head solitary, terminal, many-flowered : involucre campanulate : scales scarious, laciniate on the margins : chaff scarious, trifid, costate, mucronate : flowers of the disk campanulate, pilose, ciliated on the margin : pappus-scales fimbriate, shorter than the sericeous achene." — Leopoldina xxiii. 6. — "Chinantla, *Liebmann*, no. 598. Leaves 20 lines long, 9 lines broad."

## II. — SYNOPSIS OF THE MEXICAN AND CENTRAL AMERICAN SPECIES OF THE GENUS MIKANIA.

MIKANIA, Willd. (Dedicated to *Professor Joseph Gottfried Mikan*, of Prague, born 1743, died 1814.) — Cylindrical involucre of four erect concave obtuse or acute equal or subequal scales, sometimes with a shorter external fifth scale. Receptacle small, naked. Flowers 4 (in *M. punctata* "7"), tubular, with campanulate throat and 5-toothed limb. Anthers appendaged at the apex, obtuse or truncate at the base. Style-branches long, filiform-clavellate. Achenes 5-angled, without intermediate ribs,